

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Jeremy BARKER, *et al.*

Serial No.: 09/484,799

Filed: January 18, 2000

For: Lithium-Based Active
Materials and Preparation
Thereof

Group Art Unit: 1745

Examiner: Chaney, Carol Diane

Atty. Ref.: VT-1869

PETITION TO MAKE SPECIAL UNDER 37 C.F.R. § 1.102(c)

VIA FACIMILE to Blaine Copenheaver, Fax No. (703) 872-9469

The Honorable Commissioner of Patents
Special Programs Examiner
Technology Center 1700
Washington, D.C. 20231

Sir:

This is a Petition to Make Special the above-identified patent application. The grounds and conditions for granting this application special status are found in 37 C.F.R. § 1.102 (c), MPEP § 708.02 V (Environmental Quality) and MPEP § 708.02 VI (Energy).

Applicant believes no fee is due in connection with this petition. If an additional fee is due, authorization is hereby given to charge Deposit Account No. 19-0733.

Statement of Facts

1. The present application is directed towards lithium-based active materials and preparation thereof.

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2. Paragraphs 3-4 are supported by the declaration of M Yazid Saidi, an inventor of the present invention, attached as Exhibit A.
3. The lithium-based active materials as disclosed and claimed relate to the efficient use of energy resources, namely, rechargeable lithium-ion batteries, such as are used in electric and hybrid electric-gasoline automobiles.
4. The claimed lithium-based materials provide substantially improved performance over previously known rechargeable lithium batteries, including higher conductivity and thus higher energy density, reduced fade and thus a higher battery lifetime, and improved safety, especially with respect to large format applications (e.g. batteries for electric and hybrid electric-gasoline automobiles).
5. Paragraphs 6-10 are supported by the "Clean Alternative Fuels: Electric Vehicles" fact sheet, Environmental Protection Agency, Transportation and Air Quality, Transportation and Regional Programs Division, EPA420-F-00-034, March 2002, attached at Exhibit B.
6. Vehicles that combine an electric motor with a separate gasoline or diesel engine (hybrid vehicles) can more than double the gas mileage of conventional gasoline- or diesel-powered cars and can significantly reduce emissions.
7. Lithium-ion batteries are identified as a potential source of power for electric vehicles.
8. Lithium-ion batteries offer the potential for a long driving range and life cycle.
9. Electric vehicles are more energy efficient and produce less noise than gasoline- or diesel-powered vehicles.
10. Electric vehicles will reduce the United States' dependence on foreign oil.

11. The Environmental Protection Agency promotes electric vehicles as a cleaner-burning fuel alternative (See attached Exhibits C and D).

Points to be Reviewed

The point to be reviewed is the status of the application for expedited examination pursuant to 37 C.F.R. § 1.102.

Action Requested

Applicant requests that the Commissioner make special the above-referenced patent application based on the above Statement of Facts and the below remarks, as provided for in 37 C.F.R. § 1.102 (c) and in MPEP § 708.02 V – VI. The application should be examined out of turn on an expedited basis.

Remarks in Support of Petition to Make Special

Applicants submit this Petition to Make Special pursuant to 37 C.F.R. § 1.102 (c) on the grounds that the invention will materially enhance the quality of the environment and materially contribute to the development or conservation of energy resources.

MPEP § 708.02 V states that the U.S. Patent and Trademark office will accord special status to all patent applications that materially enhance the quality of the environment of mankind by contributing to the restoration and maintenance of the basic life-sustaining natural element air. Similarly, MPEP § 708.02 VI states that the U.S. Patent and Trademark office will accord special status to all patent applications that materially contribute to the more efficient utilization and conservation of energy resources.

As supported in the above Statement of Facts, electric vehicles, including hybrid electric vehicles, have less emission of pollutants than gasoline- and diesel-powered automobiles. Reduced emission of pollutants results in cleaner air, a basic life-sustaining natural element. Because one of the present invention's primary uses is in rechargeable lithium-based batteries that can and will be used in electric and hybrid-electric vehicles, the present invention will materially enhance the quality of the environment of mankind by contributing to the restoration and maintenance of the basic life-sustaining natural element air.

In addition, in view of paragraphs 3 and 4, above, the present invention materially contributes to the more efficient utilization and conservation of energy resources by providing a compound that can be used to make a more efficient rechargeable lithium-based battery electrode than prior known lithium-based technologies.

A search of the prior art was made by the assigned Examiner, and Applicants have previously submitted documents deemed related to the claimed subject matter.

Based on the above, Applicants respectfully petition and request that the present application be made special at the Office's earliest convenience.

Respectfully submitted,

BANNER & WITCOFF, LTD.

Date: Nov 5, 2002

By: 

Joseph M. Skerpon
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Atty. Ref.: VT-1869 (006181.00001)

DECLARATION OF M. YAZID SAIDI

The Honorable Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I, M. Yazid Saidi, hereby declare that:

- 1) I, along with Jeremy Barker, am a joint-inventor of the above-captioned application.
- 2) The present application claims a compound with the general formula



wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and mixtures thereof; and wherein $0 < y < 1$. Claims directed to electrodes and batteries comprising the above-stated composition are also provided.


- 3) The batteries in which the claimed compound is applicable can be used in large format applications, e.g. batteries for electric vehicles.
- 4) The claimed compound exhibits a high level of safety as compared to competing technologies, e.g., lithium-ion batteries containing lithium cobalt oxide and the like.

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- 5) The claimed compound provides substantially improved high-temperature performance and thermal stability over previously known rechargeable lithium-ion batteries, including higher energy density (Wh/kg), in addition to enhanced cycling.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,



M. Yazid Saidi
Valence Technology, Inc.

November 5, 2002
Date



SUCCESS STORY

As they travel from house to house, meter readers for public utility company Virginia Power are enjoying quiet, clean rides in their EVs. The company's 17 EV pickup trucks can travel 50 miles on a single battery charge.

The utility began purchasing EVs in 1993 to test and promote their use. As an electricity provider, EVs make good business sense to Virginia Power. But the company also is interested in cutting U.S. dependence on foreign oil and promoting a cleaner, more energy-efficient technology.

For more information on Virginia Power's fleet of EVs, contact Arlie Hahn at (804) 257-4008.

Clean Alternative Fuels: Electric Vehicles

One in a series of fact sheets



More than 4,000 electric vehicles (EVs) are traveling U.S. roads and highways. Although some EVs are found nationwide, California has the greatest concentration of the alternative fuel vehicles. EVs do not produce tailpipe emissions, but generators producing the electricity used to charge EV batteries do emit pollutants.

Electricity for EVs is produced by power plants, which send it to substations through transmission lines and then to homes and businesses through distribution systems. An EV's electric motor converts electricity—usually from a battery pack—into mechanical power that runs the vehicle. After a certain vehicle driving range, however, EV batteries must be recharged.

AVAILABILITY

Several major auto manufacturers are producing high-performance EVs, including passenger cars, minivans, sport utility vehicles, pickup trucks, and buses.

Homes, government facilities, and businesses must have adequate capacity for vehicle recharging, however, and special outlet hookups or upgrades may be required. In California and Arizona, some shopping malls, grocery stores, hotels, and banks have chargers in place to fuel electric vehicles.

Auto manufacturers also are beginning to sell "hybrid" vehicles that combine an electric motor with a separate gasoline or diesel engine. Hybrid vehicles can more than double the gas mileage of conventional gasoline- or diesel-powered cars and can cut emissions significantly. Hybrid vehicles do not require the use of recharging stations.



TYPES

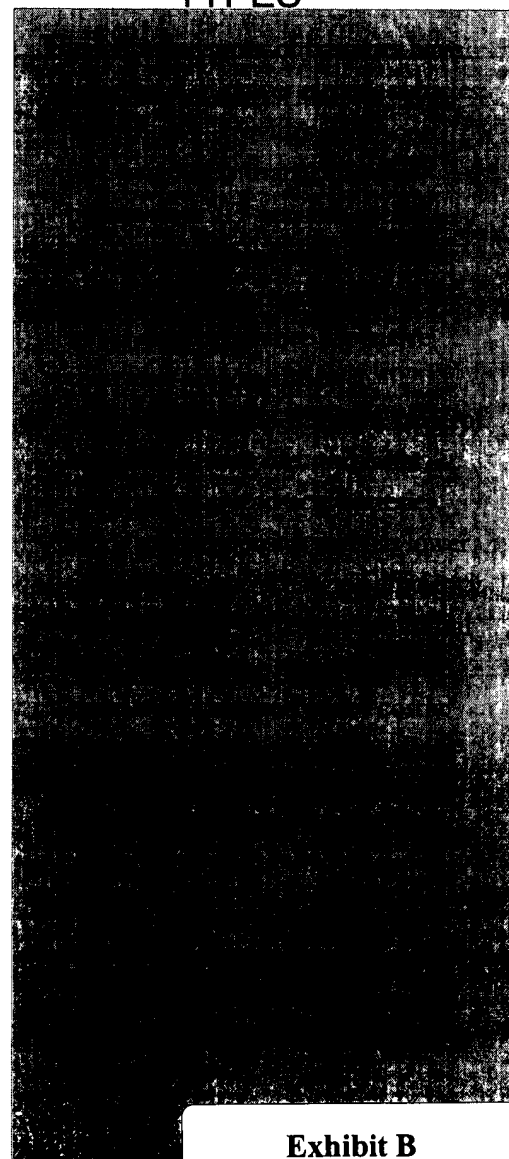


Exhibit B

AFFORDABILITY

At \$15,000 to \$40,000, EVs cost more than comparable, mass-produced gasoline- or diesel-powered vehicles. Some manufacturers lease EVs to minimize maintenance costs and potential risks such as lower resale values associated with the new technology. To encourage EV purchases, some government agencies offer incentives to offset the higher initial costs. For example, the federal government provides a tax credit equal to 10 percent (up to \$4,000) of the purchase cost of an EV. Some states offer partial sales tax exemptions, one-time income tax credits, or reduced license and registration fees.

EV purchase prices can potentially be offset by lower "fuel" and maintenance costs. The average monthly electricity cost for a typical EV driver is less than \$15, compared to \$50 for gasoline. If EVs are recharged overnight, off-peak rates can decrease the cost of powering the vehicles. EVs can also have lower maintenance costs because they have fewer moving parts than internal combustion engines and do not require tune-ups or oil changes. One obstacle to affordability, however, is that EVs' lead-acid batteries must be replaced every 3 years at a cost of approximately \$8,000.

PERFORMANCE

Testing has demonstrated that EV acceleration, speed, and handling can equal or exceed that of conventional vehicles. EVs are also more energy efficient and produce less noise than gasoline- or diesel-powered vehicles, particularly in stop-and-go traffic, because the engine does not run if the car is not moving.

Currently, a large drawback is that the driving range of EVs is much less than that for gasoline- or diesel-powered vehicles. Depending on battery type, climate, and terrain, an EV can travel from 40 to 120 miles on a single battery charge. There are also space considerations with EVs because their batteries can be large and heavy, resulting in less room for cargo or passengers.

SAFETY

EVs must meet the same safety standards as conventional vehicles. In some instances, research shows that EVs can be safer than gasoline-powered vehicles. EVs usually have lower centers of gravity, making them less likely to roll over in an accident. The danger of fire in a collision is also substantially reduced because EVs do not have a gas tank or reservoir of engine lubricating oil. As with conventional vehicles, however, EV batteries contain toxic elements that raise battery production, transport, use, and disposal safety issues.

MAINTENANCE

EVs do not require tune-ups or oil changes associated with conventional vehicles. In addition, EVs do not have timing belts, water pumps, radiators, fuel injectors, or tailpipes to replace. Battery recharging can be a frequent and lengthy process, however, taking 4 to 14 hours depending on the battery type and the voltage level used in recharging. High-voltage, fast-charging units (which take approximately 10 to 20 minutes to charge) are under development. Currently, they are being designed for limited use by some fleet operators and public charging locations.

For More Information

EPA Alternative Fuels Web Site
www.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm

Electric Vehicle Association of the Americas
701 Pennsylvania Avenue, NW.
Fourth Floor
Washington, DC 20004
Phone: 202 508-5995
Fax: 202 508-5924
Web site: www.evaa.org

Alternative Fuel Refueling Station Locator
Web site: afdcmap.nrel.gov/nrel

Alternative Fuels Data Center
Web site: www.afdc.nrel.gov

National Alternative Fuels Hotline
Phone: 800 423-1DOE





U.S. Environmental Protection Agency

Mobil Sourc Emissions - Past, Pres nt, and Future

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Fuels

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Fuel type and quality can have a major impact on both direct mobile source emissions and the performance of vehicle emission control technology. Many emission control programs, therefore, focus specifically on fuels. Here are some examples:

- Progressively stricter rules for gasoline and diesel fuel quality reduce emissions and enable the use of sensitive emission control technology. Removing lead from gasoline, for example, ensures that cars no longer release hazardous lead emissions and allows cars to use catalytic converters (which do not work with leaded gasoline). Catalytic converters greatly reduce carbon monoxide, hydrocarbon, and nitrogen oxide emissions.
- Efforts are in progress to reduce the amount of sulfur allowed in both gasoline and diesel fuel. Other fuel improvements include limits on gasoline benzene levels and fuel volatility (the tendency of gasoline to evaporate).
- Programs to encourage the use of electric vehicles and non-petroleum fuels such as alcohols and natural gas are helping to introduce these cleaner-burning alternatives.

Key Topics: Transportation and Air Quality

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Last updated on Friday, June 28th, 2002
URL: <http://www.epa.gov/otaq/inventory/overview/solutions/fuels.htm>

Exhibit C



U.S. Environmental Protection Agency

Fuels and Fuel Additives

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Alternative Fuels



EPA promotes and expands the use of environmentally beneficial alternative fuels and vehicles by providing the states with tools, such as benefits models, State Implementation Plan Credits, and the Clean Fuels Fleet program. EPA also coordinates with the Department of Energy and Department of Transportation so that their Energy Policy Act and Transportation Equity Act of the 21st Century programs promote alternative fuels and vehicles having the greatest environmental gains.

Contact: Deborah Adler phone: (734) 214-4223, email: adler.deborah@epa.gov.

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Fact Sheets on Alternative Fuels

- Compressed Natural Gas (CNG) March 2002 EPA 420-F-00-033 [\[76K PDF\]](#)
- Biodiesel March 2002 EPA 420-F-00-032 [\[72K PDF\]](#)
- Electric Vehicles March 2002 EPA 420-F-00-034 [\[68K PDF\]](#)
- Ethanol March 2002 EPA 420-F-00-035 [\[72K PDF\]](#)
- Fischer-Tropsch March 2002 EPA 420-F-00-036 [\[68K PDF\]](#)
- Fuel Cells March 2002 EPA 420-F-00-037 [\[72K PDF\]](#)
- Liquefied Natural Gas (LNG) March 2002 EPA 420-

Exhibit D

F-00-038 [72K PDF]

More than 1 March 2002 EPA 420-F-00-040 [71K PDF]

Propane March 2002 EPA 420-F-00-039 [72K PDF]

DISCLAIMER: The following fact sheets contain some outdated information, but are still a valuable reference.

- Clean Fuels: An Overview August 1994. EPA 400-F-92-008
- Alternative Fuel Demonstration January 1993. EPA 400-F-92-011
- Vehicle Fuels and the 1990 Clean Air Act August 1994. EPA 400-F-92-015



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Workshops and Meetings

- **The EPA Workshop on Alternative Fueled Vehicles (AFV) Market and Infrastructure Development**
The U.S. Environmental Protection Agency conducted a public workshop on May 10, 2000 on infrastructure issues related to creating a sustainable market for alternative fuel vehicles (AFVs). The workshop examined barriers that limit the sales of AFVs and how those barriers can be removed. A list of panelists is presented below:
 - Full Description [10K WPD] [7K PDF]
 - Workshop Discussion Panel [8K WPD] [5K PDF] 04/27/2000

Contact: Barry Garelick at (202) 564-9028 or e-mail garelick.barry@epa.gov.

Infrastructure Presentations are available below:

Presentations

- May 2000 **Summary of presentations and discussions** at the Alternative Fuels Infrastructure Workshop, San Diego, California [71K WPD] [96K PDF]
- May 2000 **Pennsylvania's Alternative Fuels Incentive Grant Fund (AFIG) - An Overview** [44K PPT] [38K PDF]
- 10-May-2000 **Infrastructure Drivers: Vehicles and Fuels of the Future** [58K PPT] [8K PDF]
Peter F. Ward, California Energy Commission

Other Presentations

- 05-Oct-99 Presentation to the American Natural Gas Association
[\[36K PDF\]](#) [\[25 K DOC\]](#)
Rob Brenner, EPA Office of Air and Radiation
- 04-June-99 Alternative Fuels [\[59K PPT\]](#) [\[68K PDF\]](#)
Presentation at the National Parks Transportation Conference
Deborah Adler, EPA Office of Transportation and Air Quality



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Certification Procedures and Emissions Standards

- Standards for Emissions from Natural Gas Fueled, and Liquified Petroleum Gas Fueled Motor Vehicles and Engines, and Certification Procedures for Aftermarket Conversions. Published September 21, 1994 [\[409K TXT\]](#)
- Final Rule: [Technical Amendments to the Test Procedures for Methanol-Fueled Motor Vehicles and Engines and Petroleum-Fueled Vehicles](#). Published June 30, 1995. This rule changed the test procedures promulgated for methanol-fueled vehicles on April 11, 1989.
- [Federal and California Exhaust and Evaporative Emission Standards for Light Duty Vehicles and Trucks](#).



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Emission Models

MOBILE6 Vehicle Emissions Model

Contact ASD Information, phone (734) 214-4636, e-mail: mobile@epa.gov

- [MOBILE6 Vehicle Emissions Modeling Software](#). This model is used for state implementation plans (SIPS) and emissions inventories.
- [MOBILE6 Emission Factors for Natural Gas Vehicles](#). (106K PDF) April 2001. EPA 420-R-01-033



--> This online tool helps calculate emission

reductions credit for alternative fuel vehicles. It is based on EPA's MOBILE Model combined with emission test certification data.

Contact Matt Payne at (734) 214-4576 or e-mail payne.matthew@epa.gov



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Other EPA Links

- [U.S. EPA Clean Fuel Fleets Program](#)
This website provides program implementation guidance, certified alternative fuel and clean fuel fleet vehicles/engines, tampering enforcement policy (memo 1A), etc.
Contact Sally Newstead at (734) 214-4474 or email newstead.sally@epa.gov
- [Alternative Fuel Vehicle Project at Los Angeles Airport \(LAX\)](#)
Contact U.S. EPA Region IX
- [Alternative Fueled Vehicles](#) - A pamphlet which discusses different types of alternative fueled vehicles to meet purchase requirements under Executive Order 12844, Federal Use of Alternative Fueled Vehicles.
- [Green Vehicle Guide, EPA](#) - Information about environmental performance of vehicles.
- [Reformulated Gasoline](#)



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External Links EXIT disclaimer

- [Alternative Fuels Data Center, U.S. Department of Energy](#) - This website provides information on alternative fuels, alternative fuel vehicles, fleets, resources, etc.
- [Alternative Fuel Refueling Station Locator, U.S. Department of Energy](#)
- [Alternative Fuel Vehicle Directory of Websites, Wesleyan College](#)
- [Alternative Fuel Vehicles & High Efficiency Vehicles \(Calif Energy Commission\)](#) - Demonstration and incentive programs
- [Clean Cities Information, U.S. Department of Energy](#) - Public/private partnerships that deploy AFVs, and

build infrastructure

- [Energy Information Administration, U.S. Department of Energy](#) Provides estimated consumption of alternative fuels, number of alternative fuel vehicles in use, survey data, articles, etc.
- [Federal Trade Commission \(FTC\) - Alternative Fuels & Vehicles](#) (labeling requirements, etc.)
- [Green Guide to Cars and Trucks](#), American Council for an Energy-Efficient Economy (ACEEE)
- [State Alternative Fuel Vehicle Laws and Regulations](#)



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